the TFI Study contained only part of MDF and power investments. It does not include "the protectors and the outside plant (OSP) cable terminated on the MDF," nor does it include "significant investments in power cables, fuse panels, filters, and low voltage electronic power equipment" that "was assigned directly to modules other than the shell."[42]

32. Second, the FCC misapplied the "shell" percentage that was derived from 1996 data to 1999 partial switching investment to estimate the amount of the MDF and power investment. In addition to its erroneous assumption that the "shell" included all MDF and power investment, the FCC's application of the ratio to 1999 partial switching investment suffered two more errors. The first is that the "shell" ratio in 1999 is expected to be substantially higher than the 8% for 1996. This is due to fact that while the total switching investment per line declined between 1996 and 1999, the costs of the "shell" components likely increased in the same period. As a result, the 1999 "shell" percentage would be substantially higher than 8%. The use of the 1996 "shell" percentage to 1999 switching investment will lead to substantially underestimated "shell" investment. The second error is that the FCC applied the "shell" percentage only to partial switching investments, rather than total switching investments.[43] This error compounded the extent of the underestimation for MDF and power investment. Based on 1996 FCC data, the TFI estimated "shell"

---

[42] *Id.* at p. 2.

[43] *Id.* at p. 1.

investment alone was about $33 per line in 1996, and is expected to be even higher for 1999.[44]

33.   Third, the FCC's errors have led to ridiculously low estimates for the investments in MDF and power. To see how implausible the estimates are, one only needs to compare them to the estimates based on the HAI Model default values, estimates that have been shown by many to be unreasonably low.[45] Based on a FCC Model default run for GTE-Oregon, the FCC's proposed methodology would produce only about $10 per line for MDF and power investment.[46] In contrast, even the HAI Model default values would produce about $18 per line.[47] That is, the MDF and power investment estimated by the FCC is about one-half the unrealistically low HAI Model estimate.

34.   Fourth, a reasonable estimate for MDF and power investment is much higher than the FCC estimate. According to TFI, the amount of "shell" investment for 1996 was about $33 per line, and is expected to be higher for 1999.[48] TFI's value of $33 per line is a conservative estimate for "shell" for 1999. To arrive at the amount of investment for MDF and power

---

[44]*Id.* at pp. 2-3.

[45] For example, SBC indicated the reasonable MDF per line is $30. Universal Service Cost Model Docket, *Comments of SBC Communications Inc.,* (July 23, 1999) at p. 13 ("SBC Comments"). Sprint and GTE also commented that the HAI power investments were unreasonably low. Universal Service Cost Model Docket, *Comments of Sprint Corporation,* (July 23, 1999) at p. 44, Attachment 7 ("Sprint Comments"). *See also* GTE Comments at p. 66.

[46] The FCC Model default runs produces about $129 per line switching investment for GTE-Oregon. Applying 8% to that yields $10.32.

[47] The $18 HAI value includes $12 for MDF and $6 for power.

[48] Attachment B at pp. 2-3.

required in the FCC Model, the parts of MDF and power that are not included in "shell" must be added. These include "the protectors and the outside plant (OSP) cable terminated on the MDF," and "significant investments in power cables, fuse panels, filters, and low voltage electronic power equipment" that "was assigned directly to modules other than the shell."[49] Due to time constraints, I have not been able to estimate precisely the amount of those excluded investments except for the protectors, which is about $12 per line. Ignoring at this time other excluded investments, the "shell" and the protectors investments combined is already $45 per line, obviously, a conservative estimate for 1999. GTE encourages the FCC to adopt this estimate.

THE FCC DID NOT SEEK COMMENT ON CERTAIN INPUT VALUES

The HAI Default Inputs

35. As many parties to this proceeding have concluded, including the FCC, the HAI Model default inputs are mostly based on the unsubstantiated opinions of its developers, and are mostly on the low side.[50] GTE expressed concerns about those inputs, with no response from the FCC.[51] Even worse, the FCC has apparently adopted some of those HAI Model default values without reasonable justification.

---

[49] *Id.* at p. 2.

[50] *See* GTE Comments at p. 66; SBC Comment at p. 13; Sprint Comment at p. 44, Attachment 7; Order at ¶ 165.

[51] GTE Comments at Attachment 1.

36.   Most of the now adopted HAI Model default inputs are located in the

        Model's end office and tandem switching, SS7 network and interoffice

        network components. For example, the HAI Model used two factors to

        reduce the tandem common equipment investments.[52] First, the

        calculated common equipment is arbitrarily reduced by 40% to account for

        the sharing with EO wire center. After the 40% reduction, the investment

        that is attributable to the excess capacities in tandem office,[53] is further

        reduced by 50%. There is no evidence that an investment reduction to

        this extent is possible, and such arbitrary sharing would lead to seriously

        underestimated costs for tandem investments. The FCC never put those

        inputs out for comments and, worse, adopted them without reasonable

        justification.

The PNR Data

37.   In response to Bell Atlantic and Sprint's concern that the line counts

        generated by the National Access Line Model do not match their actual

        line counts, the FCC indicated in its Order that the Model will true up the

        line counts to reflect the 1998 ARMIS line counts.[54] However, the FCC did

        not indicate how the 1995/6 PNR surrogate data would be adjusted to

        reflect the 1998 location counts to be consistent with the FCC-adopted

---

[52] *See* RFCC_switching_io_October1999.xls, 'tandem and STP investment'! D12: total common equipment investment. The two reduction factors are inputs!C130 (40%--- tandem/EO wire center common factor) and inputs!C89 (50%---- common equipment intercept factor).

[53] The investment is calculated as the difference between maximum design capacities and the capacities that would be needed for all the switched lines in the entire study area based on study area averages.

[54] Order at ¶ 61.

1998 line count.[55] Since there is a large increase in the line counts between 1996 and 1998, corresponding increases are expected in the number of new residential and business locations. Adjusting line counts to 1998 without a corresponding adjustment to location counts will lead to substantially underestimated costs, and a substantially smaller universal service fund, because it will lead to economies of scale that do not exist. For example, switched lines increased about 10% between 1996 and 1998 in GTE South-Kentucky. Without making the location counts consistent with the 1998 line count, the FCC Model would underestimate the universal service costs by more than $2 per line.[56] Updating the line counts from 1996 to 1998 without also updating the location counts is like using a network built based on 1996 demand to serve 1998 demand. To arrive at correct cost estimates, the location counts must be updated to be consistent with the line counts, as AT&T and MCI noted, "the key issue is the consistency of the numerator and denominator."[57]

38.   There are a number of ways to make the location counts consistent with line counts. As shown here, the most straightforward way is to use the ratios of 1998 switched lines to 1996 switched lines for each wire center to determine the number of residential and business locations for 1998. For

---

[55] According to the FCC and HAI documentation, the PNR road surrogate data reflect the numbers of lines and locations for 1995/6. Order at p. 41; HAI Model Release 5.1 Model Description at pp. 24-26.

[56] The example is based on the default runs using the most recent FCC Model and PNR data that are available to GTE. The FCC default run produces $31.86 using 1998 line counts. The use of 1996 line counts produces $33.94 per line.

[57] Order at ¶ 56.

each wire center: (1) Calculate the ratio of switched lines between 1998 and 1996 for residential and business lines respectively; (2) Use the 1996 PNR location data to find out (a) the total number of residential and business locations, and (b) the average lines per location for residential and business, respectively; (3) Multiply the ratios arrived at in (1) to the total location counts in (2) for residential and business respectively to arrive at the total number of residential and business locations for 1998; (4) For the locations that are contained in 1996 PNR location data, their location line counts would remain the same as in 1996 PNR location data. For the locations that are new in 1998, their location would be calculated by dividing the total number of 1998 new lines by the total number of 1998 new locations, for residential and business respectively. The number of 1998 new lines and 1998 new locations are derived by subtracting the 1996 lines and locations from 1998 lines and locations. And finally, (5) the locations and line counts arrived at in (4) are geocoded using the FCC adopted road surrogate method to create the PNR location data for 1998.

39.   GTE is not able to ascertain if the final PNR data selected by the FCC contains consistent line and location counts. The FCC should make available the new PNR data to allow interested parties to analyze and comment on them, before they are adopted.

Final Model and Inputs

40.   As of today, GTE still has not received the final FCC Model and inputs, as adopted in the FCC Order, and cannot duplicate the FCC's published

results. For example, GTE is still unable to duplicate either the published FCC results as contained in its Order or available via USTA for GTE South-Kentucky. The FCC results contained in the Order[58] indicate a switched line weighted cost of $34.24 per line, while the FCC results via USTA[59] indicate a different line weighted cost per line of $33.88. But, the use of the most recent available FCC Model and inputs on the FCC website (dated November 5, 1999) and the most recent PNR surrogate data available to GTE (dated July 17, 1999) produced only $31.86 per line, which is substantially different from either of the FCC's results.

41.   Without the final Model platform and inputs, the FCC Model cannot be meaningfully evaluated. The FCC should make its proposed inputs and a finalized Model platform available to interested parties so that they may comment on them before they are adopted.

THE FCC SHOULD APPLY ITS CRITERIA CONSISTENTLY IN INPUT SELECTIONS

42.   The FCC used inconsistent criteria and reasoning to select input values.

Inconsistent Use Of Company-Specific Inputs

43.   The FCC rejected the use of company-specific inputs, but then used company-specific data from Bell Atlantic Maine to set purchasing power adjustments to reduce the cable costs from the NRRI Study.

---

[58] From the FCC results contained in support_october_1999.xls.

[59] USTA CD labeled "HCPM/HAI Synthesis Cost Proxy Model, Model Results Wire center Basis, November 2, 1999", KY_GTE South Inc - Kent_Default Scenario_WC.xls.

Inconsistent Data Adjustments

44. The FCC adjusted switching costs to 1999 to take full advantage of declining switch costs, but failed to adjust many other inputs, such as copper cable and labor intensive structure costs, some of which are based on 1992 data,[60] for which costs have been increasing over time. It appears that these adjustments were not made because they would produce higher costs.

Inconsistent Selection Criteria and Reasoning

45. The FCC rejected the use of its own requested industry data on cables and structures, claiming that (1) the data were "not verifiable" because most respondents did not trace the costs by "providing copies of these contracts and all of the interim calculations for a single project or a randomly selected central office,"[61] (2) in certain cable installation cost calculation, "loading factors appear to be overstated,"[62] and (3) certain data provided by the respondents did not confirm to FCC requests.[63] On the other hand, despite containing similar or even worse infirmities, the FCC found the NRRI Study data and even the PNR's National Access Line Model acceptable. The NRRI data did not have contracts attached to

---

[60] For example, the FCC uses 1992 Massachusetts advertising expense in its marketing expense calculation.

[61] Order at ¶ 107.

[62] Order at ¶ 108.

[63] Order at ¶¶ 109-110.

enable third parties to duplicate the contract prices used by the NRRI Study. As documented extensively by GTE and others, the costs as constructed by the NRRI Study's authors, using many unjustified assumptions and allocations, do not even correspond to the geological data that they use to explain the variations in the contract costs. Some of the geological variables are based on the data fabricated by developers of the HAI Model. The NRRI data also contain many observations with zero values for material or labor costs.[64] Even worse, the NRRI Study's authors arbitrarily eliminated loading costs, some as high as 10.44% of the contract amount, from some contracts due to uncertainty on how to assign them.[65] The only reason that the FCC continues to rely on the NRRI data seems to be that the FCC's flawed analysis based on the data yields low costs and a small universal service fund. The PNR's National Access Line Model (NALM) is even more problematic in that it is a commercial proprietary product that seems to produce incorrect line distributions. While the FCC acknowledged that the NALM contained proprietary information and a very complicated process consisting of several steps, it believed interested parties have been given the opportunity to review and understand it because the HAI Model sponsors have some explanatory documents and PNR has made itself available for inquires.[66] Previously, however, when numerous ILECs responded to a FCC data request on
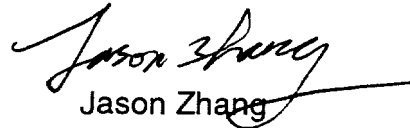
---

[64] See Sprint Ex Parte (dated January 29, 1999) at Attachment 5.

[65] GTE Comments at p. 18.

cable and structure costs, provided ample related documentation, and (I believe) made themselves available for inquiries, the FCC did not think that was good enough. As pointed out by Bell Atlantic and Sprint and acknowledged by the FCC, the NALM has produced significantly different line counts in their study areas. The incorrect results should have added to the importance of verifying NALM. Instead, the FCC simply proposed to true up the line counts to the ARMIS data without looking into whether NALM produced correct line distribution across and within wire centers.

---

[66] Order at ¶ 55.

I hereby swear, under penalty of perjury, that the foregoing is true and correct.

Jason Zhang
Jason Zhang

Subscribed and sworn to before me this 29 day of December 1999.

ALICIA M. DORSEY
MY COMMISSION EXPIRES
September 28, 2001
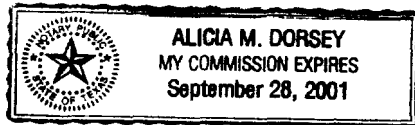
Alicia M Dorsey
Notary Public

My Commission Expires: _September 28, 2001_

B

December 22, 1999

Dr. Jason Zhang
GTE Corporation
600 Hidden Ridge. HQE02D33
Irving. TX 75038

Dear Dr. Zhang,

Technology Futures, Inc. (TFI) offers the following comments concerning the use of one of its reports in the FCC's 10th Report and Order on Universal Service, paragraph 305 and associated footnote 638:

- The FCC incorrectly concluded that the 8% "shell" investments in the TFI Study included all Main Distributing Frame (MDF) and power investments.

- The FCC's proposed adjustment also incorrectly applied the 8% factor to the RUS data which included only investments without MDF and power. The correct factor for the proposed adjustment for the 8% is 8.7%.

- Based on the TFI Study and the FCC's 1996 data, a conservative estimate of the "shell" investment which does not include all MDF and power investment is at least $33 per line for 1999.

Paragraph 305 states:

> *We find that we should adjust the RUS data for MDF and power equipment*
> *costs in a way that is more consistent with the way in which these costs are*
> *estimated in the depreciation data set. In depreciation data, MDF and power*
> *equipment costs are estimated as a percentage of the total cost of the switch,*
> *as are all other components of the switch. Based on the estimates of*
> *Technology Futures, Inc., we find these costs were eight percent of total*
> *cost.*[638] *Because we are adjusting the RUS data so that they are comparable*
> *with the depreciation data, we find it is appropriate to use a comparable*
> *method to estimate the portion of total costs attributable to MDF and power*
> *equipment. Accordingly, in order to account for the cost of MDF and*
> *power equipment omitted from the RUS information. we conclude that the*

cost of switches reported in the RUS data should be increased by eight percent.

Footnote 638 states:

> *Lawrence K. Vanston, Ray L. Hodges, Adrian J. Poitras, Technology Futures, Inc.,* Transforming the Local Exchange Network: Analyses and Forecast of Technology Change *149 (2d ed. 1997) (TFI Study). The terminology used in the TFI study differs somewhat. What TFI calls "shell" is "the common equipment, such as cabling and power equipment, that is not modular and lasts the life of the switch entity." TFI Study at 136. This includes MDF and power investment.*

The footnote acknowledges a difference in terminology between TFI's definition of the "shell" and MDF and power equipment as omitted from the RUS data. There are, in fact, significant differences. It must be understood that the TFI study is a life analysis and was not intended to identify the total cost of power and MDF. The study instead attempts to group the various components of the digital switch into modules with similar life characteristics. These modules are: processor/memory, switching fabric, trunk interface, digital loop carrier interface, baseband (analog) line interface, and shell.

The "shell" is defined on page 136 (TFI Report) as "the common equipment, such as cabling and power equipment, that is not modular and lasts the life of the switch entity." The FCC footnote 638 correctly contains this definition but inappropriately states, "This includes MDF and power investment." The last quote is incorrect when used to infer that it includes the *total* costs attributable to MDF and power. First, a significant portion of MDF costs are the protectors and the outside plant (OSP) cable terminated on the MDF. These costs are not part of the switching account in depreciation studies. The cabling from the line equipment to the MDF is all that is included. Therefore, some, but not all, of the MDF costs are included as "shell" in the TFI study. Second, all of the power equipment is not included in the "shell." There are significant investments in power cables, fuse panels, filters, and low voltage electronic power equipment which is associated with specific modules of the life study. This portion of the power investment was assigned directly to modules other than the "shell" since it would retire along with the equipment it supports.

Even without the additional MDF and power investments identified above, the TFI Study found that the "shell" investment per line based on 1996 FCC data was about $33 per line.[1] The "shell" investment per line for 1999 is expected to be even higher. The MDF is primarily metal works and cables while the power equipment is primarily batteries, copper busses and cables, and chargers. These material intense components do not benefit from technology advances and associated price declines as with other components of the digital switch. In fact, they are most likely to increase over time.

In summary, the TFI report category "shell" includes some, but not all, of the MDF and power costs. Based on the TFI report using the FCC's 1996 data, even without including all the MDF and power investments, the "shell" investment per line in 1996 was $33 per line. The "shell" investment per line for 1999 is expected to be even higher.

Sincerely,

Ray L. Hodges
Senior Consultant

---

[1] Based on an investment of $48,998,744,000 from the 1996 Statistics of Common Carriers Report, Table 2.7 by the FCC. The investment was divided by the number of access lines served by digital switches in 1996 (18,149,000) from Table 10.1 in the June 1999 FCC Monitoring Report. Eight percent of this cost per line equates to $33 per line.

In the Matter of	)	
	)	
Federal-State Joint Board	)	CC Docket No. 96-45
on Universal Service	)	
	)	
Forward-Looking Mechanism	)	CC Docket No. 97-160
for High Cost Support for	)	
Non-Rural LEC's	)	

AFFIDAVIT OF SUBHENDU ROY
IN SUPPORT OF
GTE'S PETITION FOR RECONSIDERATION
OF THE TENTH REPORT AND ORDER

I, Subhendu Roy, being duly sworn, say:

INTRODUCTION & SUMMARY

1.   My name is Subhendu Roy. I am a Specialist--Costing at GTE.

2.   I received a Master's degree in Physics in 1973 from the University of Delhi, India, a Master's degree in Economics in 1989 from the University of Wales, U.K. and a Ph.D. in Economics in 1997 from Boston University. My areas of specialization are telecommunication economics, industrial organization, international economics, and environmental economics.

3.   Over the past three years, I have worked in the development, analysis and application of telecommunications cost models. In particular, I have analyzed extensively various versions of the HAI Model (previously called the Hatfield Model), the Benchmark Cost Proxy Model ("BCPM") and the Hybrid Cost Proxy Model ("HCPM"). I have also analyzed certain aspects of the so-called "synthesis" cost proxy

model platform ("FCC Model" or "Model") adopted by the Federal Communications Commission ("FCC") on October 28, 1998 in its Fifth Report and Order.[1] I filed an affidavit detailing the flaws associated with the FCC Model platform in support of GTE's Petition for Reconsideration of the Fifth Report and Order.[2]

4.   The purpose of my present analysis is to determine whether the input values adopted by the FCC on October 21, 1999, in the Tenth Report and Order[3] are based on sound criteria and appropriate data, follow a consistent methodology, and produce reasonable, reliable, and predictable results. Unfortunately, because of the flawed, incomplete, and ever-changing nature of the FCC Model platform, the FCC's proposed inputs could not be fully evaluated.

5.   Even though my review of the FCC's adopted inputs has been similarly constrained, I have discovered many serious methodological errors, inconsistencies, and other problems. For example:

- The regression model used by the Commission to determine the portion of corporate operations expenses, customer service expenses, and plant non-specific expenses attributable to supported services is incorrectly specified and has poor explanatory power. Since the regression procedure still suffers from these problems, the

---

[1] In the Matter of Federal State Joint Board On Universal Service. In the Matter of Forward-Looking Mechanism for High Cost Support for Non-Rural LEC's, CC Docket Nos. 96-45, 97-160, *Fifth Report & Order*, FCC 98-279 (rel. Oct. 28, 1998). This docket -- 96-45 and 97-160 -- is hereafter referred to and cited as the "Universal Service Cost Model Docket."

[2] Universal Cost Model Docket, *"Affidavit of Francis J. Murphy In Support of GTE's Petition For Reconsideration Of The Fifth Report And Order"* (December 17, 1998).

[3] Universal Service Cost Model Docket, *Tenth Report and Order*, FCC 99-304 (rel. Nov. 2, 1999).

development of the GSF allocation factors based on those regression results remain flawed.

- The Model's use of an expense-to-investment ratio based on the average of a number of companies systematically understates the federal portion of universal service fund requirements.

- The procedure used for removing one-time expenses in accounts 6530 and 6700 is flawed and incorrectly identifies one-time expenses.

- The procedure used by the FCC to calculate the proportional allocation of marketing expenses is also flawed. In addition, it fails to account for a big share of marketing expenses necessary in a competitive environment.

FLAWED USE OF REGRESSION METHODOLOGY

6.   The regression methodology for estimating the portion of corporate operations expenses, customer services expenses, and plant non-specific expenses to be supported by the federal high cost mechanism is flawed. The FCC claims that "[i]n accounts 6620, 6700, 6530 the regression explains a high degree of the variability in expense variables.[4] In support of this contention, the FCC erroneously cites R^2 values ranging from 0.92 to 0.96 for those accounts. The R^2 values cited by the Commission are for the model that regresses total expenses on switched lines, special lines and toll minutes of use. In contrast, the model used by the FCC to actually estimate the portion of universal service fund expenses regresses expense/ total lines on

switched lines/ total lines, special lines/ total lines and Toll DEM/ total lines. The two models used by the Commission are mathematically similar in that the second model can be derived by dividing the various terms in the first model by total lines. However, the models are different for econometric estimation purposes because the error terms in the two models are different. Hence, it is wrong to use the R^2 value from the first model to validate a cost-causative relationship in the second model. That relationship would properly be obtained by using the R^2 value from the second model. Running the second model with FCC provided data for 1998 produces the following R^2 values: account 6620 ($R^2 = 0.19$), account 6700 ($R^2 = 0.17$), and account 6530 ($R^2 = 0.18$), which demonstrate the poor explanatory power of the regression model used by the Commission.

7. The reason the R^2 values from the second model are much lower than the R^2 values from first model is simple to understand. The first model simply predicts that expenses would increase with additional lines and higher toll minutes of usage. This is consistent with common sense and one would expect the model to have a high explanatory power. In contrast, the second model is more complex and cannot be explained so intuitively. This model seeks to establish that the expense per line would vary by the share of switched lines to total lines, the share of special lines to total lines, and the volume of toll minutes of use per line. While it is possible that switched lines and special access lines may

---

[4] Order at ¶ 389.

have different effects on expense per line and that the expense per line may also be traffic sensitive and depend on the minutes of toll use per line, the cost-causative relationship is not obvious.

8. The poor explanatory power (i.e., low R^2 values) of the second model is mainly due to omitted variables that also cause variations in per line expenses. For instance, the FCC excluded local minutes of use on two grounds. First, the FCC contended that "in most jurisdictions local calls are a flat rated service and additional local calling requires no additional information on the customer's bill."[5] The FCC claimed that any increased local minutes of use are unlikely to affect the expense per line for the three accounts. However, this may not necessarily be true. Even in the case of flat rate local calling, the higher minutes of use may be associated with greater use of vertical features or may imply greater share of business lines that generally tend to have higher usage levels. In such cases, it may imply higher expenses per line with increased minute of local use per line resulting from the above causes.

9. The FCC attempted to bolster its argument for excluding local minutes of use by stating that it "tested our assumption that local calls do not affect costs in the same way that toll calls do by running the regression to include local minutes."[6] It is not clear how the FCC arrived at the conclusion for excluding local minutes based on that reasoning. Local

---

[5] Order at ¶ 391.

[6] Id.

minutes should be included precisely because they affect costs differently than toll minutes. In fact, the low correlation of local DEM/line with other independent variables in the regression model makes it a suitable candidate for inclusion if it has significant explanatory power and improves the predictive power of the model. Rerunning the regression model with this additional term increases the R^2 values for accounts 6530, 6620, and 6700. Hence, local DEM/line should be included in the regression.

10. Even after inclusion of local DEM/line, the regression model is still inadequate since the explanatory power continues to be very low. Because data on the likely omitted variables in the FCC provided dataset are not available, it is not possible to test whether the inclusion of other variables will improve the predictive power of the model. In addition, the result of using actual lines rather than channels, as was done in the regression model, could not be tested although the variation in per line costs is unlikely to be captured correctly by channels.

11. The Commission's confusion with the two regression specifications, one with total expenses and the other with the total expenses/line, is also apparent in the discussion found in paragraph 390 of the Order regarding the absence of a constant term in the regression. While it is true that the regression specification with total expenses does not include a constant term, it is not so in the regression specification with

total expenses/line. While no constant term is explicitly used in that specification, it is implicitly present because of the use of the two explanatory variables (switched lines/total lines and special access/total lines) in the regression that sum to 1.[7]

CALCULATION OF GSF ALLOCATION FACTOR

12.   Since the FCC's regression procedure still suffers from the problems mentioned above, the development of the GSF allocation factors based on those regression results remain flawed.

IMPROPER USE OF NATIONWIDE AVERAGE EXPENSE-TO-INVESTMENT RATIOS

13.   As with most other input categories, the FCC adopted nationwide average expense-to-investment ratios for estimating plant-specific operation expenses. The FCC contends that "using nationwide averages is a better predictor of the forward-looking costs that should be supported by the federal high-cost mechanism than any particular company's costs."[8] This argument is wrong for two reasons. First, the variations in ARMIS values by companies are more due to intrinsic study area level characteristics arising from geographic and state-specific dissimilarities than company-specific variations. Thus, any

---

[7] The FCC regression model in that specification is:
$Y = aX + b(1-X) + cU + \varepsilon$
where Y is the expense per line, X is the share of switched to total lines, (1 − X) is the share of special access to total lines, U is the toll DEM per line, and ε is the error term.
After rearranging the terms in the right hand side, we find that in effect the FCC regression model is estimating: $Y = b + (a-b)X + cU + \varepsilon$
Thus, b acts as a constant term in the regression.

[8] Order at ¶ 360.

company providing service in a given study area is likely to have similar ARMIS investment and expense values.

14. Second, developing a cost estimate based on nationwide average expense-to-investment ratios would systematically understate federal universal service support requirements if the high cost areas have a higher expense-to-investment ratio. Application of an average expense-to-investment ratio in that case would lower the expenses in high cost areas and increase it for low cost areas. However, since high cost areas have a higher investment, the increase in expenses for low cost areas would be less than the decrease for high cost areas, thereby producing a smaller universal service fund.

15. Nationwide average expense-to-investment ratios will also misallocate universal service support among study areas within a state. State universal service funds are allocated among study areas based on their relative share of costs. Since expenses in the high cost areas would be underestimated, this would misallocate the fund by assigning a lower amount to the relatively higher cost areas.

16. The FCC further contends that developing study area-specific costs for federal universal service support purposes "would be administratively unmanageable and inappropriate."[9] This argument is also incorrect. While it may be difficult to estimate the current-to-book ratios for each company separately, the ARMIS data already included in the FCC

---

[9] Order at ¶ 356.

8

Model contains the investments and expenses by study area. In fact, the HAI Model, on which the expense module of the FCC Model is based, calculates the expense-to-investment ratio by study area using the included ARMIS data. The FCC has disabled this capability by overriding the default ARMIS ratios with externally calculated numbers.

17. The FCC Model can be easily modified to include the national average current-to-book ratios, along with study area-specific investment and expense values from the existing ARMIS files to develop study area-specific expense-to-investment ratios. Use of study area-specific expense-to-investment ratios would make these ratios state-specific and would obviate the need to find suitable indicators to take into account regional wage rate differences and geographic variations.

INCORRECT REMOVAL OF ONE-TIME EXPENSES

18. The Commission has abandoned its proposal of including One-Time expenses in accounts 6530 and 6700 in favor of AT&T and MCI's flawed proposal to reduce estimated expenses in account 6530 by 2.6% and in account 6700 by 20%.[10] Use of 10K and 10Q filings to identify one time expenses as suggested by AT&T and MCI would lead to erroneous results since the level of detail needed to identify these expenses do not exist in these reports. The only way to obtain data on such one-time expenses would be from individual companies.

19. Even if one could identify the one-time expenses using company

---

[10] Order at ¶ 400.